



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,748	12/13/2004	Jun Ma	100647-9330	5924

31013 7590 02/11/2009
KRAMER LEVIN NAFTALIS & FRANKEL LLP
INTELLECTUAL PROPERTY DEPARTMENT
1177 AVENUE OF THE AMERICAS
NEW YORK, NY 10036

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
----------	--------------

1793

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

02/11/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

klpatent@kramerlevin.com

Office Action Summary	Application No. 10/517,748	Applicant(s) MA ET AL.	
	Examiner KALLAMBELLA VIJAYAKUMAR	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-23, 26-28, 30-35, 76-78, 81, 82 and 84-89 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-23, 26-28, 30-35, 76-78, 81-82, and 84-89 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Claims 21-23, 26-28, 30-35, 76-78, 81-82, and 84-89 are currently pending with the application.
Claims 44 and 97 were cancelled.
- The examiner withdraws the Rejection of Claims under 35 U.S.C. 103(a) as being unpatentable over Glatkowski et al (US 7,118,693) as cumulative to the existing rejections to simplify the issues.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 21, 23, 27-28, 30, 33-34, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US 6,422,450) in view of Haddon et al (US 6,331,262).

Art Unit: 1793

Zhou et al teach a method of coating an electrode of a battery by dispersing an allotrope of carbon such as single walled carbon nanotubes in a solvent, and depositing SWNT over a substrate (Abstract). The SWNT had a diameter of 1.3-1.6 nm that formed oriented bundles of 10-40 nm dia, and produced by catalytic methods (CI-4, Ln 18-24; CI-7, Claim-1) whereby they will be free of pyrolytic surface carbon due to the catalyst. The SWNT were dispersed in a solvent such as alcohol using an ultrasonic horn and passed through a micro-pore membrane <FILTER>. The SWNT was rinsed with acid before suspending in the solution (fictionalization). The filter passed SWNT was further processed by ball-milling and deposited over the substrate. Suitable solvents were driven off at a temperature of 130-150C under vacuum (CI-4, Ln 43 - CI-5, Ln-11; CI-6, Ln 14-24; 46-65; CI-7, Claim-6).

The prior art teaches all the method steps in the instant claim-21, but silent about the aspect ratio of the SWNT.

In the analogous art, Haddon teaches solubilizing of SWNT in organic solutions for applications such as batteries, and the SWNT having a length of 1-1000 nm (Abstract, CI-1, Ln 60-62; CI-63, Ln 16-18).

The length of the SWNT and its aspect ratio in the dispersion and coatings by Zhou et al would be obvious over the teachings of Haddon et al that teaches an optimum length of 1-1000 nm for the SWNT in battery applications.

With regard to claims -23 and 76, the claimed method steps would be obvious over the disclosure by Zhou et al that teaches the use of ultrasonic.

With regard to claims 27-28 and 30, the prior art teaches using alcohols and drying between 130-150C under vacuum, and it would have been obvious to a person of ordinary skilled in the art to use alcohols with a boiling point up to 150C, that either touches or overlaps with about 150C in claim-30, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to claims 33-34, the prior art teaches bundles/aggregates of SWNT.

Art Unit: 1793

2. Claims 31-32 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US 6,422,450) in view of Haddon et al (US 6,331,262) and Shibuta et al (US 5,853,877).

The disclosure by Zhou et al (US 6,422,450) in view of Haddon et al (US 6,331,262) on the composition and method of making the coating solution/film as set forth in rejection-3 under 35 USC 103 (a) is herein incorporated.

The combined prior art fails to teach the instant claimed fibrils per claims 31-32 and 35.

In the analogous art, Shibuta teaches coating solutions and film comprising a dispersion of oxidized Graphitic fibrils/carbon microfibers with a OD of 3.5-70 nm and an aspect ratio of greater than 5 dispersed in a polar solvent (Abstract; CI-9, Ex-1) for application in batteries (CI-11, Ln 1-3).

It would have been obvious to a person of ordinary skilled in the art to substitute or include fibrils of Shibuta as functional equivalent in the coating composition of Zhou with predictable results and reasonable expectation of success, because the teachings are in the analogous art, and Zhou teaches any carbon allotrope such SWNT could be used, and the prior arts have a common utility in batteries, and Fibrils meet the limitation of MWNT in claim-35.

3. Claims 21-23, 26-28, 30-35, 76-78, 81-82, 84-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuta et al (US 5,853,877) in view of over Zhou et al (US 6,422,450).

Shibuta teaches coating solutions and film comprising a dispersion of oxidized Graphitic fibrils/carbon microfibers with a OD of 3.5-70 nm and an aspect ratio of greater than 5 dispersed in a polar solvent (Abstract; CI-9, Ln 5-6). Shibuta teaches the fibrils to exist in the form of aggregates/BN and dispersing the fibrils in a medium by milling using mechanical dispersive technology such as ball mill (CI-3, Ln 26-46), and the dispersed solution being used as a coating solution for forming a conductive film (ink) (CI-5, Ln 47-50). The making of dispersion further included stirring fibrils in a polar solvent either mechanically or by ultrasonic and with milling (CI-6, Ln 1-10). The polar solvents included water, alcohols, DMF and DMSO (CI-5, Ln 54-64). The binders included cellulose acetate and acrylics (CI -7, Ln 3-10).

The prior art teaches all the limitations of the process steps except filtering the dispersion/ink.

In the analogous art, Zhou et al teach a method of coating an electrode of a battery by dispersing an allotrope of carbon such as single walled carbon nanotubes in a solvent and depositing SWNT over a substrate (Abstract). The SWNT had a diameter of 1.3-1.6 nm and formed oriented bundles of 10-40 nm, and produced by catalytic methods (CI-4, Ln 18-24; CI-7, Claim-1) whereby they will be free of pyrolytic surface carbon due to the catalyst. The SWNT were dispersed in a solvent such as alcohol, dispersed in the solvent using an ultrasonic horn and passed through a micro-pore membrane <FILTER>. The SWNT was rinsed with acid before suspending in the solution (fictionalization). The filter passed SWNT was further processed by ball-milling and deposited over the substrate. Suitable solvents were driven off at a temperature of 130-150C under vacuum (CI-4, Ln 43 - CI-5, Ln-11; CI-6, Ln 14-24; 46-65; CI-7, Claim-6).

It would have been obvious to a person of ordinary skilled in the art to filter the dispersions of Shibuta with predictable results, because filtering fibril/SWNT dispersions for battery applications was well known in the art as taught by Zhou et al, and they have common utility as coatings for batteries, and Shibuta further teaches that various modifications to the embodiments are possible (Shibuta: CI-11, Ln 1-2; 12-15).

Response to Arguments

Applicant's arguments filed 10/28/2008 have been fully considered but they are not persuasive.

In response to the argument that, Zhou's sequence of the process steps are different than the applicants because Zhou's milling step occurs after the filtration (Pg-6-7, Sec-B); the prior art teaches all the critical steps and the processing of components in forming the dispersion/ink, and prima facie obvious over instant claimed method steps because selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results (See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) <MPEP 2144.04>. In response to the argument that Zhou's product is not an electroconductive ink and it must be solution deposited on to a substrate, the composition formed and the components processed by Zhou are either same or substantially same as that claimed by the applicants by same process steps, and should result in a composition similar to that of the applicants i.e. electro-conductive ink. Zhou does not limit the application method to a specific method as argued, but mentions

Art Unit: 1793

the easy deposition of a film from a solution by dipping (Cl-4, Ln 55-56 and 66), that is same as that coating by dipping taught by the applicants (Abstract). The same argument applies to the similar arguments over Shibuta and Zhou (Pg-8, Sec-D).

For the reasons set forth above, applicants fail to patentably distinguish their process over the prior art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALLAMBELLA VIJAYAKUMAR whose telephone number is (571)272-1324. The examiner can normally be reached on M-F 07-3.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 5712721358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
Feb 03, 2009.

/Stanley Silverman/
Supervisory Patent Examiner, Art Unit 1793

<i>Application Number</i> 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/517,748	MA ET AL.	
	Examiner KALLAMBELLA VIJAYAKUMAR	Art Unit 1793	